Chemical Occurrences - April, 1998

Class 1:

None

Class 2:

INEEL - During an acid transfer operation, an employee was "misted" by nitric acid and experienced skin and eye irritation. A metal flexible hose came out of a floor drain during the operation.

Other Occurrences of Note:

Pressurized Containers ** Fluorine Gas Release
Spill & Potential Exposure to Ammonia

Note: A minor change has been made in the way occurrences are date-sorted. In the past, reports were sorted into the month corresponding to "Discovery Date"; as of January 1998, reports have been sorted into months according to "Date of Notification Report". This minor revision will allow for quicker distribution of these Monthly Summaries without compromising comparison of report counts with past monthly values. Six (6) reports are included in this month's data with a "Discovery Date" prior to April 1998.

A search of ORPS for occurrences having chemical safety relevance conducted for the month of April 1998 produced 46 reports representing potential chemical safety concerns. These occurrences are listed in Attachment 1. There was one occurrence categorized as "Unusual" with the remainder identified as "Off-normal". The Office of Environmental Management (EM) was Cognizant Secretarial Office (CSO) for 24 occurrences, Defense Programs (DP) had 14, Energy Research (ER) four, Nuclear Energy (NE) three, and Fossil Energy (FE) had one. The CSO designation may change after the distribution of this monthly memorandum, and this change will be reflected in Quarterly and Annual Reviews.

There were no Class 1 occurrences; there was one Class 2 occurrence reported during April. There were 20 Class 3 occurrences. **(Class definitions)**

Among the Class 3 occurrences, in addition to those noted previously, were three occurrences involving airborne lead (and other) concerns: an exposure to airborne dust with lead content at Sandia, burning activities at Fernald conducted without removing lead paint as per the approved work plan, and work conducted at INEEL without appropriate personnel monitoring. Also, at Hanford, defective software resulted in errors for TWA lead analysis. There was an NOx alarm at West Valley due to a malfunction of equipment that was the subject of a previous OR. There were USQs at Los Alamos involving improper siting of a chemical storage shed and at ANL-West regarding the potential for fires involving uranium metal fines (follow-up to previous OR).

Summary of Class 2 Occurrence:

Worker "Misted" by Nitric Acid during Transfer (EM): (ID--LITC-WASTEMNGT-1998-0006) On April 25, at INEEL, operations personnel air purged a decontamination header system using plant air following a chemical transfer, per procedure. A flex hose came out of a floor drain and blew nitric acid mist onto an operator. The operator experienced minor skin and eye irritation and was sent to medical

for evaluation. The procedure being used was found inadequate. Personnel completed transferring 6.5 molar nitric acid through the decontamination header system, per procedure. At the conclusion of this transfer, the procedure requires air purging the decontamination header system with plant air to remove any residual acid. The procedure directs personnel to connect a stainless steel flex hose to a low point pipe stub on the decontamination header system and place the other end into a floor drain which drains to a waste tank. Operations personnel positioned valves in the desired configuration to support air purging the header. Operator 1 went down to the second level south corridor to observe the flex hose while Operator 2 opened the air supply valve and regulated the air pressure. During the air purge sequence, Operator 1 observed the flex hose beginning to raise out of the floor drain and attempted to stop it, but the hose came out of the drain and blew nitric acid mist on Operator 1. The nitric acid mist contacted the left side of the operator's face including the left eye. Operator 1 was sent to medical for an evaluation, and as a precautionary measure, medical sent Operator 1 to a regional medical center to be further evaluated. These evaluations determined that Operator 1 experienced minor eye and skin irritation and no permanent damage. Further use of the affected decontamination header and air purge drain system was placed on hold until the overall system can be evaluated for needed modifications and the affected procedure changed.

Other Occurrences of Note:

There were three occurrences this month having to do with pressurized chemical or waste storage containers. At PNNL (**RL--PNNL-PNNLBOPER-1998-0003**), staff reported hearing a noise from a satellite storage area and subsequently discovering a storage container with a dislodged lid and a chemical spill. Experimental work performed prior to this event involved volatile organic liquids. According to the OR: "In so much as wastes must be contained, managed and disposed in closed and sealed containers, it is unclear to what extent either the compatibility or the degree of reaction completion was fully understood prior to transfer of the end-products to the closed container." At the Y-12 Plant (**ORO--LMES-Y12NUCLEAR-1998-0035**), machining operations resulted in waste (mixed chips and sludge) that Waste Management could not readily accept. Waste acceptance criteria required placing three vent holes in bucket lids prior to shipment to Waste Management. The vent holes were used due to concerns with potential hydrogen gas build-up. Previous acceptance criteria for mixed chips and sludge did not require vent holes in the bucket lids because hydrogen gas build-up had not previously been identified as a concern. When a supervisor drilled the first hole in a bucket, a flame, approximately 1-1/2 foot long, instantaneously erupted and then immediately extinguished when the drill bit penetrated the lid. A co-worker later pointed-out to the supervisor that some hair on the supervisor's forearm appeared to be slightly singed. According to the supervisor, he sustained no skin burns. The Operations Manager and supervisor subsequently decided to carefully and slowly remove the lids from the remaining buckets (one lid popped of without causing injury) to allow any possible build-up of hydrogen to vent. They would then take the lids into the shop where the supervisor and machinist would complete the work. At Paducah (**ORO--BJC-PGDPENVRES-1998-0002**), the inner container (a polyethylene bottle, containing corrosive liquids) of a steel drum was found to be pressurized. This drum had been under observation during the past three weeks due to the potential of being pressurized. The container was vented without any spillage of the liquid contents.

At Sandia (**ALO-KO-SNL-9000-1998-0007**), while changing a 5% fluorine, 95% neon gas cylinder, a small amount (106 mg) of fluorine gas was released. Previous to the release a new fluorine gas bottle had been placed into service. Since the pressure gauge read zero, it was assumed that the bottle was empty. The valve on the bottle was turned off and the fitting was loosened. While loosening the fitting, the line popped off and released the fluorine gas. The individual exposed to fluorine was sent to medical where it was determined that there was no injury as a result of the potential exposure. It was determined that a pneumatically actuated valve had never been opened which would be required to get a pressure

reading on the gauge. Opening this valve is part of the bottle change out procedure.

At Fernald (**OH-FN-FDF-FEMP-1998-0014**), a spill occurred inside a trailer which was being used to store bulk quantities of chemicals. Because the material spilled was believed to be non-hazardous, precautions were not taken during clean-up, some material was tracked outside the trailer, and Industrial Hygiene representatives stated that there may have been some personnel exposure to ammonia when employees entered the trailer. IH subsequently reviewed the list of materials in the trailer and suggested that all personnel involved in the operation be sent to Medical for evaluation as a precautionary measure. IH conducted monitoring of the trailer and detected trace amounts of ammonia in the air. A critique was conducted, and it was determined that there was no requirement for the workers involved to review the MSDSs for the bulk materials being handled.

Additional information regarding these occurrences and others will be discussed in an upcoming Quarterly Review; some are currently summarized on this website. As occurrence reports are finalized, lessons learned will be communicated.

This report approved by

Sanji Kanth
DOE Office of Worker Health and Safety

Note:

A version of this report is distributed via e-mail either as a WordPerfect or a text file. Please contact **John Usher** (516-344-2096, Fax: 516-344-3957, E-mail: usher@bnl.gov) at Brookhaven National Laboratory to be placed on e-mail distribution. If you want to receive hardcopy, please contact John Usher who will make every effort to accommodate you.

Please feel free to use the other resources available on the DOE Chemical Safety Program homepage. The Internet address is http://tis-hq.eh.doe.gov/web/chem_safety/.